

Amendments to the Claims

This listing of claims will replace all prior listings of claims in the application.

Listing of Claims

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1-10. (Canceled)

11. (Previously Presented) The method of Claim 21, further comprising the steps of:

causing the cap held by the capping head to descend and fit around a mouth of the vessel;

stopping the descent at an elevation where the distal end of the threads on the cap abut against the distal end of the threads on the vessel;

rotating the cap until a position is reached where at least the distal ends of both threads on the cap and vessel abut against each other while measuring a change in the force acting on the cap under a condition of the descent having ceased; and

detecting a position where an increase occurs in the acting force as an incipient position of meshing engagement where the distal ends of both threads first contact each other.

12. (Previously Presented) The method of Claim 21, further comprising the steps of:

causing the cap held by the capping head to descend and fit around a mouth of the vessel;

rotating the cap in a direction opposite to the clamping direction until a rotational position is reached where at least the distal end of the threads on the cap disengage from the threads on the vessel while measuring a change in the force acting on the cap; and

detecting a position where the acting force changes from increasing to decreasing as an incipient position of meshing engagement where the distal ends of both threads first contact each other.

13. (Previously Presented) The method of Claim 21, further comprising the steps of:

causing the cap held by the capping head to descend and fit around a mouth of the vessel;

rotating the cap in the clamping direction during its descent at such a speed that the cap rotates through at least one revolution while it descends by a vertical distance corresponding to the width of one of the threads on the vessel;

continuing the rotation of the cap in the clamping direction until a rotational position is reached where at least the distal ends of both threads on the cap and the vessel abut each other while measuring a change in the force acting on the cap; and

detecting a position where a change in the acting force occurs as an incipient position of meshing engagement where the distal ends of both threads first contact each other.

14. (Previously Presented) The method of Claim 21, in which a rotational load acting on the cap is measured as the acting force.

15. (Previously Presented) The method of Claim 21, in which a vertical load acting on the cap is measured as the acting force.

16. Canceled.

17. (Previously Presented) The capping apparatus of Claim 22, wherein the elevating mechanism ceases the descent

of the capping head at an elevation where the clamping of the cap onto the vessel is to be initiated.

18. (Previously Presented) The capping apparatus of Claim 22, wherein the elevating mechanism and the control means are arranged so that the cap is rotated in the clamping direction during its descent at such a speed that the cap rotates through at least one revolution while it descends by a vertical distance corresponding to the width of one of the threads on the vessel.

19. (Previously Presented) The capping apparatus of Claim 22, wherein the control means measures a rotational load acting on the cap as the acting force.

20. (Previously Presented) The capping apparatus of Claim 22, wherein the control means measures a vertical load acting on the cap as the acting force.

21. (Currently Amended) A method of clamping a cap onto a vessel comprising the steps of:

providing a cap having threads, a vessel having threads with a predetermined winding angle adapted to engage with the threads of the cap, a capping head holding said cap and a motor for rotating the capping head in a clamping direction;

rotating the cap and the vessel relatively with respect to each other ~~in a state~~ at an elevation where the threads on the cap and vessel are not engaged with each other;

measuring the torque acting on the cap when the distal ends of the threads of the cap and vessel come into contact with each other to detect an incipient position of meshing engagement where the distal ends of both threads contact with each other; and

rotating the cap in a clamping direction by a predetermined rotational angle with respect to the incipient position of meshing engagement to clamp the cap to the vessel.

22. (Currently Amended) A capping apparatus for clamping a cap onto a vessel, said apparatus comprising:

a capping head for holding a cap having threads;

a motor for rotating the capping head in a clamping direction so that the cap can be clamped onto a vessel having threads with a predetermined winding angle adapted to engage with the threads of the cap;

an elevating mechanism for raising the capping head up and down;

measuring means for measuring torque acting on the cap held by the capping head;

angle detecting means for detecting an angular position to which the capping head is rotated; and

control means for rotating the cap and the vessel relatively with respect to each other ~~in a state~~ at an elevation where the threads on the cap and the vessel are not engaged with each other, measuring the torque acting on the cap when the distal ends of the threads of the cap and vessel come into contact with each other to detect an incipient position of meshing engagement where the distal ends of both threads contact with each other and rotating the cap in a clamping direction by a predetermined rotational angle with respect to the incipient position of meshing engagement to clamp the cap to the vessel.

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